

WHAT IS CLAIMED IS:

1           1. A plasma generator, in which a plasma  
2   forming space, into which the air is introduced, is  
3   provided, band plate-like first and second electrodes  
4   are arranged in opposed relation to each other through  
5   a dielectric in the plasma forming space, and plasma  
6   is generated by discharge caused by applying voltage  
7   between the first and second electrodes,

8           wherein the first and second electrodes are  
9   provided on one surface and another surface of the  
10   dielectric, respectively, and arranged in a state  
11   relatively displaced in a surface direction of the  
12   dielectric so as to satisfy the following Equation 1  
13   to Equation 3:

14   (Equation 1)

$$15 \qquad \tan\theta_2 = \frac{L1}{d}$$

17   (Equation 2)

$$18 \qquad \tan\theta_1 = \frac{1}{\epsilon_2} \tan\theta_2$$

20   (Equation 3)

$$21 \qquad 26 \times 10^6 [\text{V/m}] \geq \frac{\cos\theta_1 \cdot \sin 2\theta_2}{d \sin 2\theta_1} \quad V=E_1(\text{max})$$

23   wherein L1 is a separate distance between a front end  
24   edge position of the first electrode and a  
25   corresponding end edge position of the second

26 electrode, which is located on an outside in a  
27 displacement direction of the electrodes from the  
28 front end edge position of the first electrode and  
29 closest to the front end edge position of the first  
30 electrode, in the surface direction of the dielectric,  
31  $\theta_2$  is an angle formed by an imaginary plane including  
32 the front end edge of the first electrode and the end  
33 edge of the second electrode with a thickness-wise  
34 direction of the dielectric,  $d$  is a thickness [m] of  
35 the dielectric,  $V$  is the intensity [V] of voltage  
36 applied between the first and second electrodes,  $\theta_1$  is  
37 an outgoing angle of an electric field in the plasma  
38 forming space at a boundary surface of the dielectric,  
39  $\epsilon_2$  is a dielectric constant of the dielectric, and  
40  $E_1(\text{max})$  is a maximum value [V/m] of the electric field  
41 at the end surface of the electrode.

1           2. The plasma generator according to claim 1,  
2 wherein the corresponding end edge of the second  
3 electrode is formed by a rear end edge of the second  
4 electrode.

1           3. The plasma generator according to claim 1,  
2 wherein the corresponding end edge of the second  
3 electrode is formed by a front end edge of the second  
4 electrode.

1           4. The plasma generator according to any one of  
2 claims 1 to 3, wherein the angle  $\theta_2$  formed by the  
3 imaginary plane with the thickness-wise direction of  
4 the dielectric is at least  $45^\circ$ .

1           5. The plasma generator according to any one of  
2 claims 1 to 3, wherein a ratio ( $L1/d$ ) of the separate  
3 distance  $L1$  to the thickness  $d$  of the dielectric is 1  
4 to 3.

1           6. The plasma generator according to claim 4,  
2 wherein a ratio ( $L1/d$ ) of the separate distance  $L1$  to  
3 the thickness  $d$  of the dielectric is 1 to 3.

1           7. The plasma generator according to any one of  
2 claims 1 to 3, wherein the voltage applied between the  
3 first and second electrodes is 2.5 to 3.5 kV.

1           8. The plasma generator according to claim 4,  
2 wherein the voltage applied between the first and  
3 second electrodes is 2.5 to 3.5 kV.

1           9. The plasma generator according to claim 5,  
2 wherein the voltage applied between the first and  
3 second electrodes is 2.5 to 3.5 kV.

1           10. The plasma generator according to claim 6,

2 wherein the voltage applied between the first and  
3 second electrodes is 2.5 to 3.5 kV.

1 11. A plasma generator which is provided with a  
2 plasma forming space, into which the air is introduced,  
3 and has, in the plasma forming space, an electrode  
4 arrangement structure that band plate-like first and  
5 second electrodes are arranged in spaced relation from  
6 each other in the same plane in the sectional  
7 thickness of the dielectric, and the following  
8 Equation 4 is satisfied:  
9 (Equation 4)

$$10 \quad 26 \times 10^6 [\text{V/m}] \geq \frac{V}{L2}$$

11  
12 wherein L2 is a separate distance [m] between the  
13 first electrode and the second electrode, and V is  
14 voltage [V] applied between the first and second  
15 electrodes.

1 12. A plasma generator which is provided with a  
2 plasma forming space, into which the air is introduced,  
3 and has, in the plasma forming space, an electrode  
4 arrangement structure that band plate-like first and  
5 second electrodes are arranged in spaced relation from  
6 each other are formed on a surface of the dielectric,  
7 a surface of at least either one of the first and  
8 second electrodes being coated with a dielectric film,

9 and the following Equation 4 is satisfied:  
10 (Equation 4)

11 
$$26 \times 10^6 [\text{V/m}] \geq \frac{V}{L2}$$
  
12

13 wherein L2 is a separate distance [m] between the  
14 first electrode and the second electrode, and V is  
15 voltage [V] applied between the first and second  
16 electrodes.

13. The plasma generator according to claim 11  
or 12, wherein the voltage applied between the first  
and second electrodes is 2.5 to 3.5 kV.